Air Force SBIR **Impact**

Environmentally Friendly Multi-Functional Cleaning System

Company:
Entropic Systems, Inc.

Location:
Winchester, MA

Employees:
6

President:
Dr. Robert Kaiser

Project Officer:
William Jarosz,
SMC/XRR
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CA

Air Force Requirements:

The Air Force has a continuing interest in developing safe, effective, and environmentally friendly cleaning processes for its most delicate instruments such as the internal components of ballistic missiles. Removing particulate contaminants from this precision equipment previously required chemicals and processes that would result in harmful environmental impact. New formulations of the cleaning agents were needed as well as an innovative cleaning process. This combination of actions would have a dramatic and lasting impact on both Air Force requirements and the environment.

SBIR Technology:

Entropic Systems, Inc. (ESI) won Air Force SBIR Phase I and II contracts to address the problem. ESI used the knowledge it had gained from previous associated SBIR contracts to improve the performance characteristics of environmentally acceptable perfluorocarbons (PFC) and hydrofluorocarbons (HFC) as cleaning agents. ESI's approach to the problem was to upgrade the performance of these PFC and HFC materials by the incorporation of effective additives, while insuring that these additives do not detract significantly from the safety and environmental characteristics of these materials.

ESI evaluated the performance of a range of PFC and HFC formulations. This resulted in an array of new cleaning formulations of much broader applicability than those established previously. These include the removal of a broad range of organic soils, by either dissolution or emulsification (i.e. displacement cleaning), and displacement drying of residual water, in addition to enhanced particle removal.

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To demonstrate the capabilities of these different formulations, a prototype cleaning system that could support these different cleaning functions was designed, fabricated and tested. This Multi-Functional Cleaning System (MFCS) is being used by the Air Logistics Center at Hill AFB, UT to ultrasonically clean a variety of smaller components of the Minuteman III control systems that are refurbished at this facility. Under a subsequent Phase III program, that resulted from this SBIR contract, ESI designed and built a spray/flush booth to clean the larger Minuteman III components that could not fit in the MFCS.

Company Impact:

The various formulations developed under this SBIR project have allowed ESI to address a wide range of critical Air Force precision cleaning problems. ESI has taken full advantage of the potential commercial applications of this SBIR technology. Precision cleaning systems have been developed and sold to the aerospace, automotive, and precision instrument/gauge industries. Other systems under development by ESI address the decontamination, for reuse, of sensitive equipment that has been exposed to radioactive fallout, chemical warfare agents, or biological agents.

Company Quote:

"The SBIR program not only allowed us to transform concepts into useful, working hardware, but provided us with that critical first customer whom we could use as a reference."

Dr. Robert Kaiser
President
Entropic Systems, Inc.

SBIR

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